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which might lead a careless reader to think that this was the sole source of Sperm Oil, even though in dealing with the Sperm Whale fishery it is apparent that this is not the case. Another statement capable of misinterpretation is that the "entire Arctic fleet was destroyed by pack ice in 1871," which happily was not the case, as, while 34 ships were crushed in the ice, seven vessels were left which brought home the crews without the loss of a single life.

In the very useful bibliography, we miss, among some others, any reference to Starbuck's "History of the American Whale Fishery" with its wealth of information and detailed lists of vessels and their catch. That the "Speckshioner" and his duties are not defined nor his title mentioned in the index is possibly a personal grievance due to "satiating curiosity" aroused by Kipling.

But these are trivial matters; destructive criticism is the easiest thing in the world, and to point out all the good things in the book would be to write another. Jenkins' "History of the Whale Fishery" is simply indispensable to any one interested in the subject of whaling, and in these days, when information in regard to the early days of the industry is eagerly sought for, and paintings, models and relics of the old whale ships bring surprisingly large prices, this book should be most welcome.

F. A. LUCAS

AMERICAN MUSEUM OF NATURAL HISTORY

SPECIAL ARTICLES

BACTERIAL PUSTULE OF SOY BEAN

EVER since 1904¹ there have been scattering references in phytopathological literature to a bacterial leaf spot or bacterial blight of soy bean, due, it was assumed, to *Bacterium phaseoli* Erw. Sm., but there has been no publication of any experimental proof of this theory. In 1917 Johnson and Coerper² pub-

lished a note on a bacterial blight of soy bean caused by a white organism which in a later paper by Miss Coerper³ was named *Bact. glycineum*. Since then Wolf⁴,⁵ and Shunk⁵ have described a bacterial leaf spot caused by an organism which the former has named *Bacterium sojae*, but which is very similar to if not identical with *Bact. glycineum* Coerper.

Since the publication of these papers there have been an increasing number of references in the literature, including the reports of the plant disease survey of the U. S. Department of Agriculture, to "bacterial blight" or "bacterial leaf spot" of soy bean without any mention of the causal organism, due to the assumption, presumably, that there is but one disease and that due to *Bact. glycineum* Coerper.

In 1917 the writer isolated from soy bean leaves from Texas a yellow organism very closely resembling *Bact. phaseoli* Erw. Sm. With pure culture inoculation with this organism infection has been repeatedly produced both on soy beans and several varieties of garden beans belonging to the genus *Phaseolus*. From these artificial infections the same yellow organism has been re-isolated and with it infections have been produced on sound plants. The infections on *Phaseolus* when made in favorable circumstances are not to be distinguished from those caused by *Bact. phaseoli* isolated from *Phaseolus*, but, except under very abnormal conditions to be described in a paper in preparation, no infections have ever been obtained on soy-bean with the latter organism, although repeated attempts have been made. Furthermore, there are certain internal markings very commonly though not universally present in the colonies of the soy-bean strain of the organism which have been observed in only two colonies of the many thousands isolated from *Phaseolus*. The markings

³ Coerper, Florence M.: "Bacterial Blight of Soy Bean," *Jour. Agr. Res.*, XVIII, No. 4, pp. 179-193, 1919.

⁴ Wolf, F. A.: "Bacterial Blight of Soy Bean," *Phytopathology*, X, No. 3, pp. 119-132, 1920.

⁵ Shunk, I. V., and Wolf, F. A.: "Further Studies on Bacterial Blight of Soy Bean," *Phytopathology*, XI, No. 1, pp. 18-24, 1921.

¹ Smith, Erwin F.: "Bacterial Leaf-spot Diseases," *SCIENCE*, N. S., XIX, No. 480, pp. 416-418, 1904.

² Johnson, A. G., and Coerper, Florence M.: "A Bacterial Blight of Soy Bean" (abstract), *Phytopathology*, VII, 65, 1917.

have the appearance of central convolutions. They are wholly internal, the surface of the colony being smooth. Illustrations will be published in a later paper. The markings might be described in brief as a mottled, wrinkled (convolute) central area fading to a homogeneous margin, appearing in five to seven days and visible for one to two weeks. In view of these facts the writer, rightly or wrongly, has decided to name the soy bean organism *Bact. phaseoli* var. *sojense*.

The writer has never seen the *Bact. glycineum* blight in the field, but, judging from Miss Coerper's description and illustrations and her own greenhouse experiments the two diseases very closely resemble each other in the later stages. In the early stages, however, they are quite different, *Bact. glycineum* causing a water-soaking, a phenomenon never observed in the disease under consideration. *Bacterium phaseoli* var. *sojense* does, however, produce water-soaking in *Phaseolus*. Another difference—only noticeable in young infections is a slight raising of the center of the infected area in the case of infection with *Bact. phaseoli* var. *sojense*, hence the name "pustule." This raised portion may occur on one or both sides of the leaf and rarely, if ever, exceeds 1 mm. in diameter. It ultimately collapses or is sloughed off. Microscopic examination of these pustules shows both hypertrophy and hyperplasia. In the later stages the disease is characterized by angular reddish brown spots on the leaves, varying in size from tiny inconspicuous specks to large irregular brown areas involving a considerable portion of the leaf. Frequently the leaves have a ragged appearance due to the dropping out of portions of the large spots. A conspicuous though not universal accompaniment of this disease is a pronounced yellowing. The writer believes that in this stage only the isolation of the parasite could make possible a correct diagnosis of the disease, and it is in the hope of avoiding further confusion that this preliminary note is published. A paper covering the results of work since 1917 is in preparation. This disease occurs from Washington southward.

FLORENCE HEDGES

U. S. DEPARTMENT OF AGRICULTURE

THE AMERICAN CHEMICAL SOCIETY

(Continued)

DIVISION OF DYE CHEMISTRY

William J. Hale, chairman

R. Norris Shreve, Chemistry

The preparation of phenylglycine-o-carboxylic acid. I. *From anthranilic acid and monochloroacetic acid:* HERBERT L. HALLER. A study of the preparation of phenylglycine-o-carboxylic acid from anthranilic acid and monochloroacetic acid has been undertaken. Optimum conditions have been determined for (1) concentration in water of the reacting substances, (2) time allowed for reaction, (3) ratio of reacting materials, (4) condensing agent, and (5) temperature of reaction mixture.

On the preparation of 7-7' Di (α -hydroxyisopropyl) indigo: MAX PHILLIPS. Starting with p-cymene obtained from "sulphite turpentine" and using a modified procedure of the Heumann phenylglycine-o-carboxylic acid synthesis of indigo, a new indigoid dye has been prepared. The method used consists in first nitrating p-cymene, then oxidizing the nitro cymene to o-nitro p-hydroxyisopropyl benzoic acid; reducing this to o-amino p-hydroxyisopropyl benzoic acid; condensing the latter with monochloroacetic acid to hydroxyisopropyl phenylglycine-o-carboxylic acid and finally fusing with potassium hydroxide. This new dye has a similar absorption spectrum to that of indigo and has quite similar dyeing properties.

A new method for the preparation of dicyanine and related dyes (By title): S. PALKIN.

The necessity for reclassification and standardization of dyes: C. R. DELONG and W. R. WATSON.

The influence of sulphur on colors of azo dyes: W. R. WALDRON and E. EMMET REID. Some 30 different bases containing sulfur in a variety of positions and associated with various alkyl and aryl radicals have been prepared, diazotized and coupled with representative dye intermediates to form dyes so as to show the influence of sulfur groups in various positions on the color. Bases having sulfur in the sulfide and sulfone condition have been compared with the sulfur-free bases, and it has been found that the sulfide sulfur is bathochromic while the sulfone group is usually hypsochromic.

Experiments with dehydrothio-p-toluidine and related compounds: MARSTON TAYLOR BOGERT and MARTIN MEYER. When dehydrothio-p-toluidine is subjected to Skraup reaction, it yields the corresponding benzothiazolyl quinoline. The Atophan